

First record of *Chlorophorus herbstii* (Brahm, 1790) in Greece and new localities of *Xylosteus bartoni* Obenberger & Mařan, 1933 (Coleoptera, Cerambycidae)

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Abstract

In this study, *Chlorophorus herbstii* (Coleoptera, Cerambycidae) was reported for the first time for Greek fauna. Another longhorn beetle, *Xylosteus bartoni*, has been found in two new localities in the country.

Keywords

Saproxylic, Cerambycidae, Greek Forests

Introduction

Saproxylic beetles are in the spotlight of conservation biology, being the only beetle group that is systematically approached by conservation biologists, e.g., in Red catalogues (Nieto, Alexander, 2010; Cáliz et al., 2018) or as “umbrella species” (Eckelt et al., 2017). In essence, saproxylic Coleoptera act as a proxy to assess and protect a plethora of beetle families that participate or depend on the decaying of the dead wood, as well as other forest dwelling species. The saproxylic beetle fauna of Greece is not adequately known. In fact, Greece is leading among other European countries

in Data Deficient species (Cálix et al., 2018). The issue of Data Deficient species and species of poor knowledge is pivotal in conservation biology, since we cannot estimate their threat status, their ecological functions in bio-communities or even their inclusion in protected areas (see Hortal et al., 2015; Borgelt et al., 2022). Thus, it is evident that the expansion of our knowledge concerning the distribution and the ecology of saproxylic beetles is important for their conservation. In Greece, due to the lack of concrete knowledge for its saproxylic fauna, it is quite common to introduce novel data on this subject, especially near the northern borders of the country where European/Balkan species may exhibit the southern part of their distribution (e.g., Dascălu et al., 2012; Mpamnaras, Eliopoulos, 2017). Here we record for the first time the presence of *Chlorophorus herbstii* (Brahm, 1790) in Greece. Moreover, we expand the dataset for *Xylosteus bartoni* Obenberger & Mařan, 1933.

Methods and materials

The beetles were collected via handpicking and pitfall trapping during Natural History Museum of Crete (NHMC) expeditions in northern Greece. The specimens were morphologically examined under stereo microscope (Leica M205C, Wetzlar, Germany), photographed with CANON 5Ds and MP-E 65mm f/2.8 1-5x macro lenses and the images have been stacked with Zerene Stacker 1.04, 64-bit software. The specimens (being initially stored in 99% pure alcohol in the wet collections of NHMC), were dry-mounted subsequently for the microscopic examination/identification & photographic documentation.

Results

Chlorophorus herbstii (Brah, 1790)

Material examined

Greece: 1 ♂, Kotyli (Xanthi), 41.333200N; 24.884300E, 618 m a.s.l., 10.7.1996, Trichas A. leg., (NHMC).

C. herbstii (Fig. 1.c) has a Eurosiberian distribution (Georgiev et al., 2022). Primary expands in Central Europe, while it is generally absent in the south. Its range does not include Italy (Bense, 1995; Mannerkoski et al., 2009; Danilevsky, 2023), while it is probably extinct in France (Mannerkoski et al., 2009). It is also reported in Spain, from a locality in Pyrenees (Vives 2001), while it has recently expanded to the northern part of its range, in Norway (Sovelåg & Ødegaard, 2012). The beetle develops in various broadleaf trees (especially on *Tilia*, but also on *Quercus*, *Carpinus*, *Ulmus*, *Betula*, *Padus*, *Crataegus*) (Bense, 1995). The adults can be observed on flowers (Bense, 1995), but for a short time-period, rendering difficult the sampling or adult detection (Schmidl, 1999).

Here we expand its distribution range with the first record from NE Greece. Aside from the population in Pyrenees, this is the southernmost record of this species, although it is probable to be found in lower latitudes in Albania, North Macedonia (which for the moment are not included in its distribution) and Greece. The specimen was found near Kotyli village (Xanthi, Thrace, NE Greece). This location is relatively close to known locations from Bulgaria (Orehovo: Gradinarov et al., 2020; Bansko: Georgiev et al., 2022; Smolyan: iNaturalist, 2022). As in the case of *Xylosteus bartoni* (see below), it appears that woodboring cerambycids dwelling in southern Bulgarian forests are commonly found in the nearby bordering areas of Greece. The question arising is if they are established elements of the Greek cerambycid fauna or these observations are trails of evanescent range shifts. Furthermore, no additional records have occurred since 1996, although this can be attributed to the lack of systematic sampling effort focusing on the saproxylic fauna of Greece. Further research on this subject could unveil new localities for this species in Greece and outline its southern Balkan limits or indicate that it is indeed an impermanent element to the Greek saproxylic fauna.

***Xylosteus bartoni* Obenberger & Mařan, 1933**

Material examined

Greece: 1 ♂, Mikromilia E, 41.4212N; 24.1725E, 755 m a.s.l., 7.7.1996, Trichas A. leg., (NHMC); 1 ♀, Stravorema, Elatia E, 41.497679N; 24.344096, 1380 m a.s.l., 9.7.1996, Trichas A. leg., (NHMC).

X. bartoni (Fig. 1.a, b) is a rare, montane, Balkan endemic, Lepturinae species associated with conifers (*Picea*, *Pinus*) (Bense, 1995). The species is distributed in the south Balkans (Bulgaria and North Macedonia) and has been quite recently recorded in Greece, at 1150 m a.s.l., near Veironia village, Kerkini (Dascălu et al., 2012). The locality is a mixed forest of *Fagus* and *Picea*, matching the species' habitat preferences. Additionally, Rapuzzi, Sama (2018) described a subspecies of *X. bartoni* (*X. b. migliaccioi*) which is now considered a synonym of the nominal species (Danilevsky, 2023) using specimens from Bulgaria and Greece (Rhodope). They reported 10 specimens from Elatia forest, close to the second location provided herein. We report two new localities for Greece from the Rhodope mountain range. The presence of *X. bartoni* in the Greek side of the Rhodope mountain range was expected, since the species has been recorded from nearby sites from Bulgaria (Gradinarov et al., 2020; Georgiev et al., 2022), with the closest locality being in Trigrad (Gradinarov et al., 2020). It appears that there is ground for further research regarding the range of this rare species in the northern part of Greece. Our records are older than those of Dascălu et al. (2012) and Rapuzzi, Sama (2018), implying an established presence of the species in the Greek side of the borders. Of course, *X. bartoni* individuals and genetic material exchange between Bulgarian, Greek and North Macedonian populations is most likely to occur. Further research regarding the species' distribution in northern Greece could shed more light in its taxonomy, biogeography and conservation status.

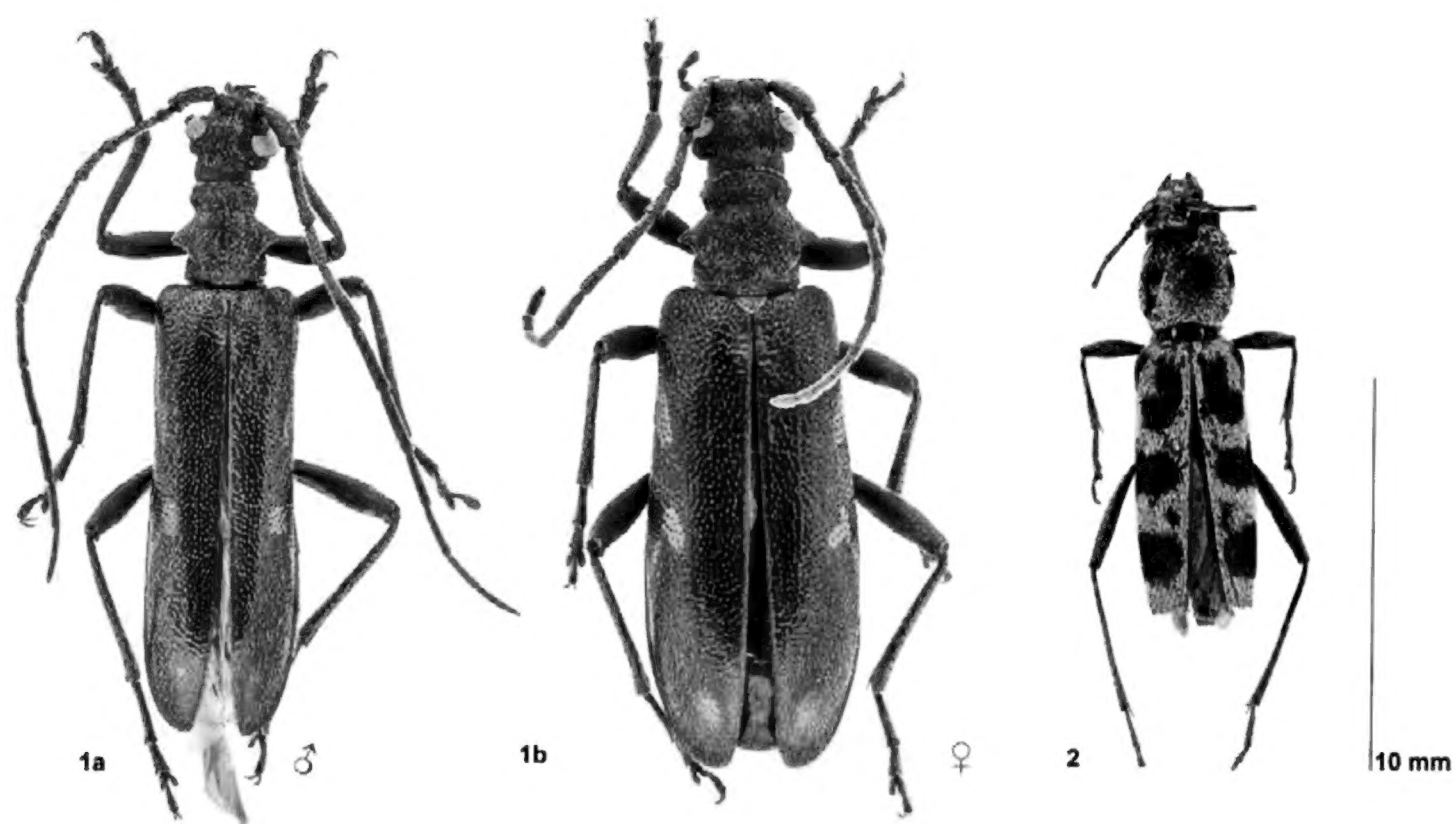


Figure 1. The specimens of: (a) *Xylosteus bartoni* (male); (b) *Xylosteus bartoni* (female); (c) *Chlorophorus herbstii*, in NHMC collections

Discussion

There are frequent records of new cerambycid faunal elements in the peripheral areas of Greece (e.g., Dauber, 2004; Wełnicki and Przewoźny, 2007; Mpamnaras and Eliopoulos, 2017). It appears that there is an -expected- interplay between the saproxylic fauna of Greece and those of its adjacent countries in its northern borders. Discoveries such as *X. bartoni* and *C. herbstii* in the Greek fauna, encourage us to examine carefully the fluidness of saproxylic biodiversity in the northern part of the country. Do these species form established populations or not? Is there a continuous exchange with the saproxylic faunas of the other Balkan countries, with populations migrating and extirpating from one country to another? These biogeographical and conservation questions can be answered with extensive sampling, monitoring and the use of molecular tools and require interborder collaborations. Given the species turnover as a result of climate change (Vitali et al., 2023), we can assume that populations at the limits of a species distribution are more likely to exhibit fluctuations or local extinctions. Therefore, a close monitoring of these populations could provide an empirical framework for the estimation of the impact of climate change to these species.

Systematic focus on the continental Greece – especially in its northern regions – is required in order to obtain a satisfactory knowledge of the synthesis of the Greek saproxylic beetle fauna, as well as to delimit the range of the species that constitute it.

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